a spectral processing system that determines a first set of channels from the second plurality of channels which can reconstruct spectra of the portion of the image to satisfy a first error criterion when compared to the captured high spectral resolution data, wherein the imaging system captures pixel data of the scene using the first set of channels.

27. (Amended) The system as set forth in claim 22 wherein the spectral processing system compares at least once the high spectral resolution data for a second portion of a second scene against the estimated spectral resolution data captured using the first set of channels for the second portion of the second scene to determine an intermittent error, the spectral processing system determines a second set of channels from the second plurality of channels which can reconstruct spectra of the second portion of the second scene to satisfy the first error criterion when compared to the captured high spectral resolution data if the intermittent error is greater then a second error tolerance, and the imaging system captures pixel data of at least a portion of any remaining portion of at least the second scene using the second set of channels.

32. (Amended) The system as set forth in claim 22 wherein the number of the first plurality of channels and the second plurality of channels are identical.

33. (Amended) A method for spectral imaging, the method comprising:

capturing a first high spectral resolution data of at least a first portion of a first scene using a plurality of channels;

capturing pixel data of at least a second portion of a first scene using a first set of channels from the first plurality of channels;

determining a first transform based on the first set of channels and the first high spectral resolution data;

generating an image of the first scene using the transform and the captured pixel data;

capturing high spectral resolution data of at least a second portion of a second scene using a plurality of channels;

applying the first transform to the pixel data from the first set of channels to the second portion of the second scene to produce spectral estimates;

compare the spectral estimates to the high spectral resolution data to determine an intermittent error; and

B3 determining a second transform based on the first set of channels and the second high spectral resolution data if the intermittent error is greater than a first error tolerance.

Sub b1 37. (Amended) A system for spectral imaging, the system comprising:

a first imaging sub-system that captures a first high spectral resolution data of at least a first portion of a first scene using a plurality of channels;

a second imaging sub-system that captures pixel data of at least a second portion of a first scene using a first set of channels from a plurality of channels; and

B4 a spectral processing system that determines a first transform based on the first set of channels and the first high spectral resolution data generates the image of the first scene using the transform and the captured pixel data;

wherein the first imaging sub-system captures high spectral resolution data of at least a portion of a second scene using a plurality of channels and wherein the spectral imaging system applies the first transform to the pixel data from the first set of channels of the at least a portion of the second scene producing spectral estimates, compares the spectral estimates to the high spectral resolution data to determine an intermittent error and determines a second transform based on the first set of channels and the second high spectral resolution data if the intermittent error is greater than a first error tolerance.

Sub b1 41. (Amended) The system as set forth in claim 37 wherein the first and

B5 second imaging sub-system are the same imaging system.

-- 42. The system as set forth in claim 22 wherein the imaging system further comprises:

B6 a first imaging system that captures the high spectral resolution data of at least the portion of the first scene using the plurality of channels; and

a second imaging system captures the pixel data of the scene using the first set of channels. --